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AN OVERVIEW OF COST ACCOUNTING PRACTICES USED FOR US  
DEFENSE WEAPON SYSTEMS REVISION(U) GEORGE MASON UNIV  
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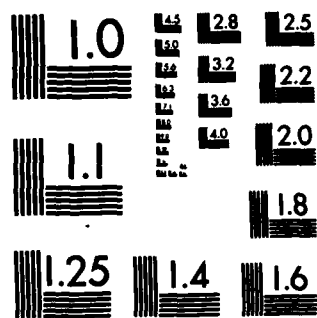
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AN OVERVIEW OF COST ACCOUNTING PRACTICES  
USED FOR U.S. DEFENSE WEAPON SYSTEMS

A Term Paper Presented To  
Dr. Robert LeRosen, Professor  
Accounting Department  
George Mason University  
Fairfax, Virginia 22030

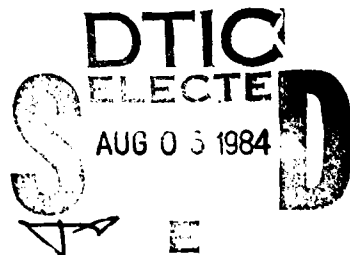
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of the requirements for the degree  
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By

Claire L. Brown

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19. ABSTRACT (Continue on reverse if necessary and identify by block number) Until the past forty years, virtually no government agency had to account for its cost or budgets. In the years since World War II, considerable steps have been taken by Congress and by the Department of Defense to promulgate accounting standards for consistency in reporting by Defense contractors and to review all cost estimates for weapon systems at each stage of development.					
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## INTRODUCTION

For the first 175 years of American history, there was virtually no cost accounting anywhere in the government. Preplanning for the American War effort in World War II was sadly deficient. There was no comprehensive system of priorities, and military and civilian demands for crucial production elements outstripped available supplies. During the Cold War, defense spending continued for years at a high level, but without the excuse of a specific emergency to justify waste or extravagance.

In 1949, the National Security Act (and its amendments since then) required performance budgeting in the Department of Defense, established working capital funds and comptroller positions, and gave the Comptroller General authority to set accounting requirements in terms of principles and standards.

Public Law 90-23 established the Cost Accounting Standards Board (CASB) in 1970 for the purpose of setting up standards with which all defense contractors must comply.

Other agencies such as the Defense Systems Acquisition Review Council (DSARC) and the Cost Analysis Improvement Group (CAIG) have also been established within the Defense Department to oversee spending limits.

This paper provides an overview of the development of cost accounting within the government, but particularly for defense weapon systems.

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## WHAT IS COST ACCOUNTING?

Anthony and Reece define cost accounting as the perpetual inventory method [in which] the cost of each product is accumulated as it flows through the production process and the amounts involved . . . are obtained directly from the cost records. (Anthony, p. 137).

Simini describes cost accounting in much more detail. He describes the cost accounting organization as a specialized section of the accounting effort which has as its function the development of the unit cost of production. These costs may be determined in one of three ways:

1. Based on the production process (job-order costs or process costs).
2. Based on price (historical or standard costs).
3. Based on the timing of the expense (absorption or direct costing). (Simini, p. 9).

Definitions of these six types of cost accounting follow. Some definitions of other related terms that may better help the reader's understanding of the cost accounting process may be found in the glossary (APPENDIX B).

1. Job-order cost accounting. This method is used when the process consists of separable units of production such as two types of explosives, TNT and RDX. Even though TNT is used for demolition and RDX is used in projectiles, they can be made on the same production line. This type of production is characterized by general-purpose machinery in which the process can be stopped and the explosive ingredients changed to allow another type of explosive to be processed through the same machine at little or no increase in cost to either lot. This is a labor-intensive process.
2. Process cost accounting. This method is used when the process requires continuous input of machinery such as two types of rifles, the M-14, and the M-16. An M-14 rifle is a wood and metal composition whereas the M-16 rifle is a plastic and metal composition. Because of these differences, the machinery would have to be tooled differently for each weapon and could not be stopped or changed except at a considerable cost increase. An operation of this nature is considered a capital-intensive process.

3. Historical cost accounting. This method uses actual prices for the actual quantities of labor and material used for production cost. Unit costs will vary depending on which alternatives in terms of wages and materials are used.
4. Standard cost accounting. This method assumes that a product has a standard quantity of labor and material and that these elements have a standard cost. In reality these costs can vary and the variances are recorded and used to determine overall changes in cost policy.
5. Absorption cost accounting. This method includes all indirect product costs (overhead) to be included in the unit prices and since absorption costs and direct costs are determined on a fiscal year basis, this makes the cost of uncompleted goods on hand at the years' end higher than under direct costing. (Simini, pp. 11-13). The full cost of the manufacturing process is "absorbed."
6. Direct cost accounting. This method includes only the variable costs directly included in the cost of the product, such as direct labor and materials. (Skigen, pp. 14-15).

## THE DEVELOPMENT OF COST ACCOUNTING IN THE U.S. GOVERNMENT

A discussion of Cost Accounting of weapon systems necessarily must discuss the historical events that led to this type of accounting thought.

In 1778, Article 1, Section 9 of the American Constitution required that:

No money shall be drawn from the treasury, but in consequence of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time.

An act of September 2, 1789 established the Treasury Department, and directed the Secretary of the Treasury "to prepare and report estimates of the public revenue and public expenditures." There is no evidence that the Treasury Department ever complied with this request.

From 1789 to 1921 the various agencies of the Federal Government prepared their financial estimates individually each setting forth its own needs. These were assembled by the Treasury Staff and presented to Congress without comment or revision. During this time the government's expenditures did not exceed its receipts, which came mostly from customs duties.

Following the Spanish-American War and America's emergence as a world power, federal expenditures increased more rapidly than sources of income. In 1911, a committee appointed by President Taft published a report, The Need For A National Budget which made the president, and in turn, each agency within the executive branch, responsible for financial planning and fiscal management. However, Taft was defeated in the 1912 election, and Woodrow Wilson let this proposal die. Public interest continued and The National Budgeting and Accounting Act was signed into law by Warren G. Harding on June 10, 1921.



For the first dozen years, the Bureau of the Budget (Office of Management and Budget) which was established to administer this law, misused its authority and was only concerned with a balanced budget and reducing the national debt, instead of any type of cost accounting. However, about this time, businesses began to find the need for estimating their revenues before they could determine operating alternatives.

The two main sources of systematic business budgeting were industrial engineering and cost accounting. Such experts as Frederick Taylor, Henri Fayol and H. L. Gantt were instrumental in developing planning and budgeting methods to accurately compute worker performance. These techniques were introduced into such government agencies as the Forest Service, the Census Bureau and the Bureau of Reclamation.

Cost accountants helped systematize budgeting by establishing a system of records within which standard costs could be developed and routinely compared with actual results. Their early efforts to apply overhead to production on the basis of activity estimates led naturally to the idea of estimating expected costs in the form of a budget. Later they took the lead in setting standards for selling and financing expenses. Direct costing and refined methods of capital budgeting were other industrial accounting techniques which found applications in government budgeting.

Between 1929 and 1945 the Depression, The New Deal, and World War II had a tremendous effect on the economy, but were not instrumental in cost accounting development. Fiscal year 1931 brought a drop in receipts, a rise in expenditures, and the first of sixteen successive federal deficits. Preplanning for the American War effort in World War II was sadly deficient. There was no comprehensive system of priorities, and military and civilian demands for crucial production elements outstripped available supplies.

In the early postwar period, the Federal government began to adopt commercial accounting practices on a large scale. The Government Corporations Control Act of 1945 required that government-owned corporations use accrual accounting and separate their capital and revenue expenditures. Corporate budgets had to be supported by cost information that would be audited by the Comptroller General.

The Cold War created a fiscal situation unique in American history. Defense spending continued for years at a high level, but without the excuse of a specific emergency to justify waste and extravagance. In 1947 the National Security Act established the Department of Defense and in 1949 the Act was amended to require performance budgeting in the Department of Defense. Other amendments to the same Act authorized the establishment of working capital funds and comptroller positions in the Defense Department, and gave the Comptroller General authority to set accounting requirements in terms of principles and standards.

In 1956, legislation provided for subsidiary fixed asset records as part of each agencies' accounting system. But in 1957, amendments to the National Defense Act giving the Secretary of Defense more power made a crucial difference.

In 1961, Secretary of Defense Robert McNamara, began using his power to evaluate ongoing effectiveness of military construction programs and new weapons systems. Recognizing the need for continuous rather than annual review of ongoing programs, he created the Planning-Programming-Budgeting System (PPBS). Some of its functions include:

1. Identifying national goals.
2. Choosing the most urgent goals.
3. Searching for alternatives.
4. Planning for subsequent years' costs.

\* 5. Measuring the performances of our programs to insure a dollar's worth of service for each dollar spent.

\* It is this fifth function on which the rest of this paper will focus.

## THE COST ACCOUNTING STANDARDS BOARD

In the 1960's there was considerable debate in Congress about whether to establish uniform cost accounting standards for defense contracting. Vice Admiral Hyman G. Rickover was one who testified repeatedly about the lack of uniform accounting. He asserted that because of the lack of consistency in defense contractor accounting practices, the government was unable to make meaningful comparisons between cost data submitted by two or more contractors for the same effort.

On August 15, 1970, President Nixon signed into law an amendment to the Defense Production Act of 1950 (PL 91-379) creating the Cost Accounting Standards Board (CASB). The Board was authorized to achieve uniformity and consistency in defense contractor accounting practices. These standards were to be used in negotiated contracts in excess of \$100,000. (Simpson, p.1).

During its ten year life, the CASB established nineteen CAS which have been adopted by other government agencies as well, in particular, the Department of Energy and the National Aeronautics and Space Administration (NASA). Brief descriptions of the nineteen standards are APPENDIX A of this paper.

The CASB was a five-man board headed by the Comptroller General, Elmer Staats, and responsible to Congress. The Board met once a month to review proposals which had been worked out by staff members. The proposed standard was then issued through the Federal Register and comments were received. After any revision, the standard was again issued through the Federal Register. (Mautz, pp. 332-336).

The appropriation for the CASB for fiscal year 1981, which never exceeded a relatively small \$2 million, was eliminated from the Congressional Budget and the Board effectively died on September 30, 1980. Until his resignation on March 7, 1981, Elmer Staats was determined not to let the work of the Board die. He also worked on a transfer of the responsibilities to OMB so that simplifying and modifying standards, granting waivers on individual contracts, establishing exemptions, and possibly new standards could continue.

As of August, 1984, the files still reside at GAO, but there is no authority to conduct any functions of the CASB. There is currently a bill before the House of Representatives, HR 5480, to reestablish the CASB as part of the Executive Branch. Charles A. Bowsher, who is now Comptroller General, has testified in support of this measure before a House committee.

Although defense contractors complain about many of the standards, Staats was quoted as saying that they have enabled "the government, as a buyer, to compare costs and make sure they are allocated consistently." (Can. . .", pp.141-142).

GAO's report on the government's implementation of CAS indicates that the Departments of Defense and Energy and NASA are generally doing a good job of administering the standards. The standards are readily available to their field offices and personnel training was adequate for all procurement personnel to make "expert" advice available in each region. GAO also found that CAS clauses were being included properly in negotiated contracts. (GAO, pp.i-iii).

A second report investigating contractor compliance with the CASB regulations has not yet been published.

## OTHER DEFENSE COST ANALYSIS GROUPS

During the Vietnam War buildup, there was substantial cost growth in weapon systems. Secretary of Defense Melvin Laird instituted DoD Directives 5000.1 (policy) and 5000.1 (procedures) in regard to weapon systems acquisition. In 1972, DoD Directive 5000.4 (a requirement of the other directives) established an independent cost analysis office. (Morgan).

### Defense Systems Acquisition Review Council (DSARC)

DSARC, AN ADVISORY GROUP TO THE Secretary of Defense, reviews all major defense systems acquisition programs and related policy. Each system is checked at each major decision point for contract and cost breaches. Irregularities are cause for interim DSARCs.

### Cost Analysis Improvement Group (CAIG)

CAIG has the dual function of reviewing service cost estimates for the DSARCs, and fostering defense-wide improvements in military cost analysis capabilities.

CAIG is made up of representatives from the Under Secretary of Defense, the Assistant Secretaries of Defense, each military departments' cost analysis representatives, and the Joint Chiefs of Staff.

## CONCLUSION

Until the past forty years, virtually no government agency had to account for its costs or budgets. In the years since World War II, considerable steps have been taken by Congress and by the Department of Defense to promulgate accounting standards for consistency in reporting by Defense contractors and to review all cost estimates for weapon systems at each stage of development.

Certainly this system is not perfect and still requires much room for improvement, but a first step has been taken and other government agencies are being made to comply with similar cost accounting standards.

## APPENDIX A

### COST ACCOUNTING STANDARDS (Code, pp. 95+)

#### CAS 401 - CONSISTENCY IN ESTIMATING, ACCUMULATING AND REPORTING COSTS.

Purpose: The purpose of this Cost Accounting Standard is to insure that each contractor's practices used in estimating costs for a proposal are consistent with cost accounting practices used by him in accumulating and reporting costs.

#### CAS 401 - CONSISTENCY IN ALLOCATING COSTS INCURRED FOR THE SAME PURPOSE.

Purpose: The purpose of this standard is to require that each type of cost is allocated only once and on only one basis to any contract or other cost objective.

#### CAS 403 - ALLOCATION OF HOME OFFICE EXPENSES TO SEGMENTS.

Purpose: The purpose of this standard is to establish criteria for allocation of the expenses of a home office to the segments of the organization based on the beneficial or casual relationship between such expenses and the receiving segments.

#### CAS 404 - CAPITALIZATION OF TANGIBLE ASSETS.

Purpose: This standard requires that, for purposes of cost measurement, contractors establish and adhere to policies with respect to capitalization of tangible assets which satisfy criteria set forth in this standard.

#### CAS 405 - ACCOUNTING FOR UNALLOWABLE COSTS.

Purpose: The purpose of this standard is to facilitate the negotiation, audit, administration and settlement of contracts by establishing guidelines covering the cost accounting treatment to be accorded identified unallowable costs.

#### CAS 406 - COST ACCOUNTING PERIOD.

Purpose: The purpose of this standard is to provide criteria for the selection of the time periods to be used as cost accounting periods for contract cost estimating, accumulating, and reporting.

#### CAS 407 - USE OF STANDARD COSTS FOR DIRECT LABOR AND DIRECT MATERIAL.

Purpose: The purpose of this standard is to provide criteria under which standard costs may be used for estimating, accumulating and reporting costs of direct material and direct labor and to provide criteria relating to the establishment of standards, accumulation of standard costs and accumulation and disposition of variances from standard costs.



CAS 408 - ACCOUNTING FOR COSTS OF COMPENSATED PERSONAL ABSENCE.

Purpose: The purpose of this standard is to improve, and provide uniformity in the measurement of costs of vacation, sick leave, holiday and other compensated personal absence for a cost accounting period, and thereby increase the probability that the measured costs are allocated to the proper cost objectives.

CAS 409 - DEPRECIATION OF TANGIBLE CAPITAL ASSETS.

Purpose: The purpose of this standard is to provide criteria and guidance for assigning costs of tangible capital assets to cost accounting periods and for allocating such costs to cost objectives within such periods in an objective and consistent manner.

CAS 410 - ALLOCATION OF BUSINESS UNIT GENERAL AND ADMINISTRATIVE EXPENSES TO FINAL COST OBJECTIVES.

Purpose: The purpose of this standard is to provide criteria for the allocation of business unit general and administrative expenses to business unit final cost objectives based on their beneficial or casual relationships.

CAS 411 - ACCOUNTING FOR ACQUISITION COSTS OF MATERIAL.

Purpose: The purpose of this standard is to provide criteria for the accounting for acquisition costs of material and includes provisions on the use of inventory costing methods.

CAS 412 - COMPOSITION AND MEASUREMENT OF PENSION COST.

Purpose - This standard establishes the basis on which pension costs shall be assigned to cost accounting periods and provides guidance for determining and measuring the components of pension cost.

CAS 413 - ADJUSTMENT AND ALLOCATION OF PENSION COSTS.

Purpose: The purpose of this standard is to provide guidance for adjusting pension cost by measuring actuarial gains and losses and assigning such gains and losses to cost accounting periods.

CAS 414 - COST OF MONEY AS AN ELEMENT OF THE COST OF FACILITIES CAPITAL..

Purpose: The purpose of this standard is to establish criteria for the measurement and allocation of the cost of capital committed to facilities as an element of contract cost.

CAS 415 - ACCOUNTING FOR THE COST OF DEFERRED COMPENSATION.

Purpose: The purpose of this standard is to provide criteria for the measurement of the cost of deferred compensation and the assignment of such cost to cost accounting periods.

CAS 416 - ACCOUNTING FOR INSURANCE COST.

Purpose: The purpose of this standard is to provide criteria for the measurement of insurance costs, the assignment of such costs to cost accounting periods, and their allocation to cost objective.

CAS 417 - COST OF MONEY AS AN ELEMENT OF THE COST OF CAPITAL ASSETS UNDER CONSTRUCTION.

Purpose: The purpose of this standard is to establish criteria for the measurement of the cost of money attributable to capital assets under construction, fabrication or development as an element of the costs of those assets.

CAS 418 - ALLOCATION OF DIRECT AND INDIRECT COSTS

Purpose: The purpose of the Cost Accounting Standard is (a) to provide for consistent determination of direct and indirect costs, (b) to provide criteria for the accumulation of indirect costs, including service center and overhead costs, in indirect cost pools, and (c) to provide guidance relating to the selection of allocation measures based on the beneficial or casual relationship between an indirect cost pool and a cost objective.

[There is no CAS 419]

CAS 420 - ACCOUNTING FOR INDEPENDENT RESEARCH AND DEVELOPMENT COSTS AND BID AND PROPOSAL COSTS.

Purpose: The purpose of this Cost Accounting Standard is to provide criteria for the accumulation of independent research and development costs and bid and proposal costs and for the allocation of such costs to cost objectives based on the beneficial or casual relationship between such costs and cost objectives.

## APPENDIX B

The following terms, in addition to those discussed earlier in this paper, are related to cost accounting terminology and are grouped according to relationship to each other. (Skigen, pp. 8-15).

Cost - Price paid for the acquisition, maintenance, production or use of materials or services.

Sunk cost - Cost of a fixed asset, not readily marketable.

Current cost - Costs representing immediate expense.

Fixed costs - Costs that do not change in relationship to output.

Variable costs - Changes in total with changes in activity.

Total costs - Sum total of the individual costs of project, manufacturing process, or time period without regard to the number of units produced.

Unit costs - Total costs divided by the number of units produced.

Product costs - Costs that are directly attached to the product. The product cannot be produced without incurring the cost. Raw material, direct labor, overhead, and usually inventory costs are included in product costs.

Period costs - Any cost that cannot be assigned to inventory, because no value is added to the product as a consequence of incurring the cost. It is related to the current period and not to any future period. All nonmanufacturing expenses are treated as period costs. Examples are the sales manager's salary, the financial or general accountant's salary, and depreciation on the building.

Controllable costs and non-controllable costs - A cost that is reasonably subject to regulation by a division head or other executive of the segment being measured. The higher the manager's level, the more costs are under his control and should therefore be maintained at some preplanned level.

Manufacturing costs - Those costs associated with production.

Non-manufacturing costs - Selling, distribution, and administrative costs.

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